

Babygro Book



Babygro Book

Empowering Parents for Joyful Parenting and Healthy Brain Development



Published by Babygro
Registered Charity 1196651
www.babygro.org

Copyright © Babygro 2022
The moral rights of the author have been asserted.
Written and designed by Amanda Lucas.

Babygro would like to thank and credit Jess James (jessjames.uk) for the photographs taken at our workshops: front and back covers, and pages 5, 54, 103, 104.

ISBN 978-1-3999-2823-6
eBook ISBN 978-1-3999-3255-4

All rights reserved.

Without limiting the rights under copyright reserved above, no part of this publication may be reproduced, stored in or introduced into a retrieval system, or transmitted, in any form or by any means (electronic, mechanical, photocopying, recording or otherwise), without the prior written permission of both the copyright owner and the above publisher of this book.

Designed & typeset by Babygro.
British Library Cataloguing-in-Publication Data.
A catalogue record for this book is available
from the British Library.

Babygro would like to express gratitude to Pascal Vrticka and our partnership with the Social Neuroscience of Human Attachment Lab for the knowledge shared in the creation of this book. Babygro gratefully acknowledges the support of Cornwall Community Foundation.





Dr Amanda Lucas
Founding Director

While lecturing on infant development at the University of St Andrews, I became a mother myself.

I came to understand, first hand, how challenging and relentless - as well as extraordinary and life-affirming - it is to care for a new baby.

I was shocked at how much misinformation was circulating in guide books and on the internet, and confounded by cultural pressures to do things in certain ways.

Later, as a mother of two, I founded Babygro as a charity.

Our aim is to empower parents by bringing them trusted, evidence-based information that enables them to feel reassured and confident in their parenting choices.

How to Use This Book

Section One: An introduction to four important networks of the brain as they develop in a typical, healthy child who has been enriched with CHATS:

- 10 Connection Network
- 20 Stress-Fear-Pain Network
- 28 Regulation Network
- 38 Self & Other Network
- 50 The Four Brain Networks Working Together

Section Two: An Introduction to CHATS:

- 54 Five elements of parent-and-baby communication that lead to healthy brain development and optimal later-life outcomes
- 58 Cues
- 72 History
- 76 Attachment
- 102 Talk
- 108 Synchrony

- 127 Further Reading and Viewing



Section One

Connection Network

HYP

= hypothalamus

vmMPF/OFC

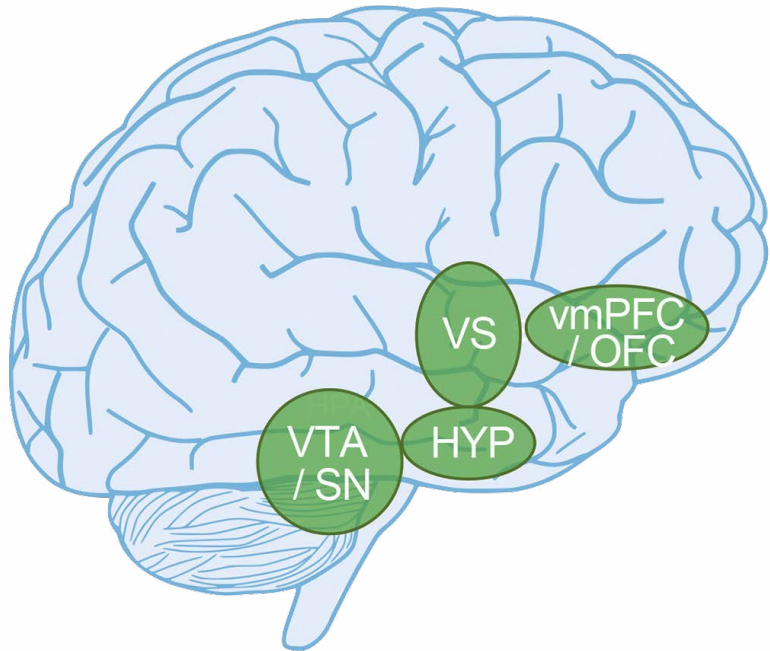
= ventromedial
prefrontal/orbitofrontal
cortex

VS

= ventral striatum

VTA/SN

= ventral tegmental area
/ substantia nigra



From 'A functional neuro-anatomical model of human attachment' (2020) – see further reading

Connection Network

Also known as the 'reward' or the 'approach' network, this system provides feelings of intense pleasure and reward in response to holding, touch, eye contact, smiles and social interaction.

It also provides:

- feelings of safety
- the instinct to reach out to others for help when needed
- feelings of well-being, delight and joy
- the drive to be curious and exploratory

This network of the brain resides mostly in the 'limbic system', the emotional heart of the brain. It is functional from birth (although it develops throughout childhood), and is common to all mammals.

This means that babies, from birth, are full of feelings!

Connection Network

Oxytocin

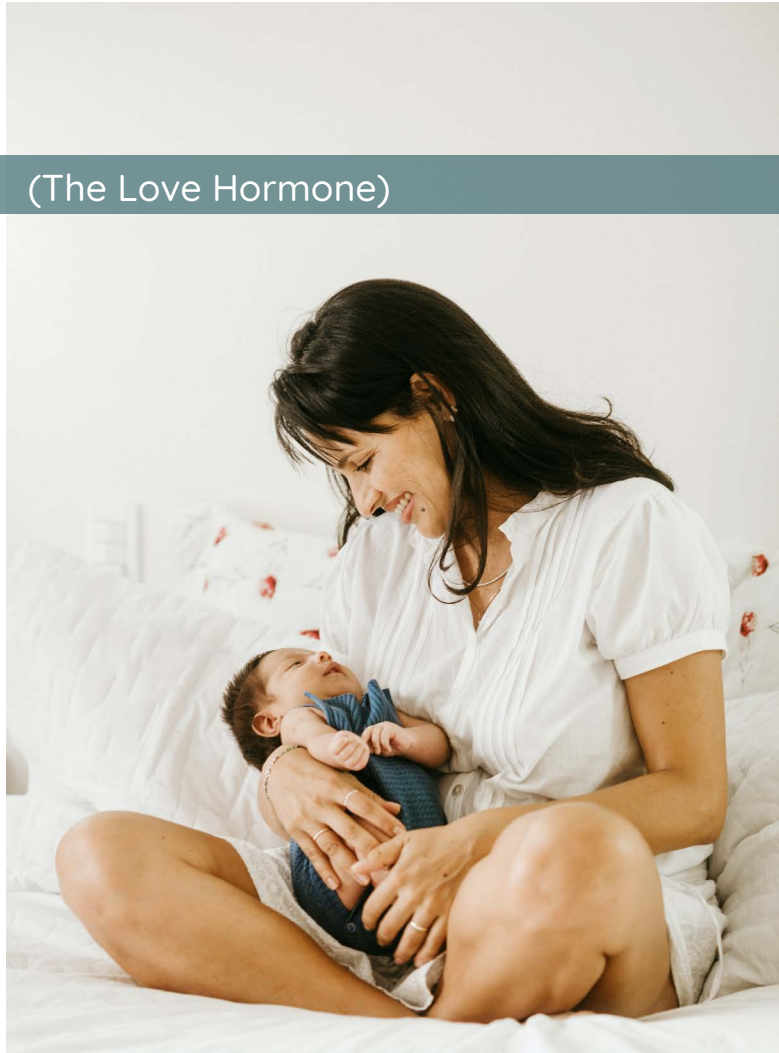
(The Love Hormone)

nurturing

trust

cosiness

safety



Connection Network

(The Reward Hormone)

Dopamine

pleasure

motivation

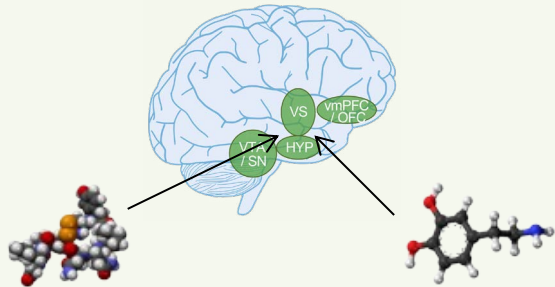
feel-good

effort



Connection Network

Oxytocin and dopamine receptors coupled together in the brain



Oxytocin

Dopamine

make **social interaction** rewarding.



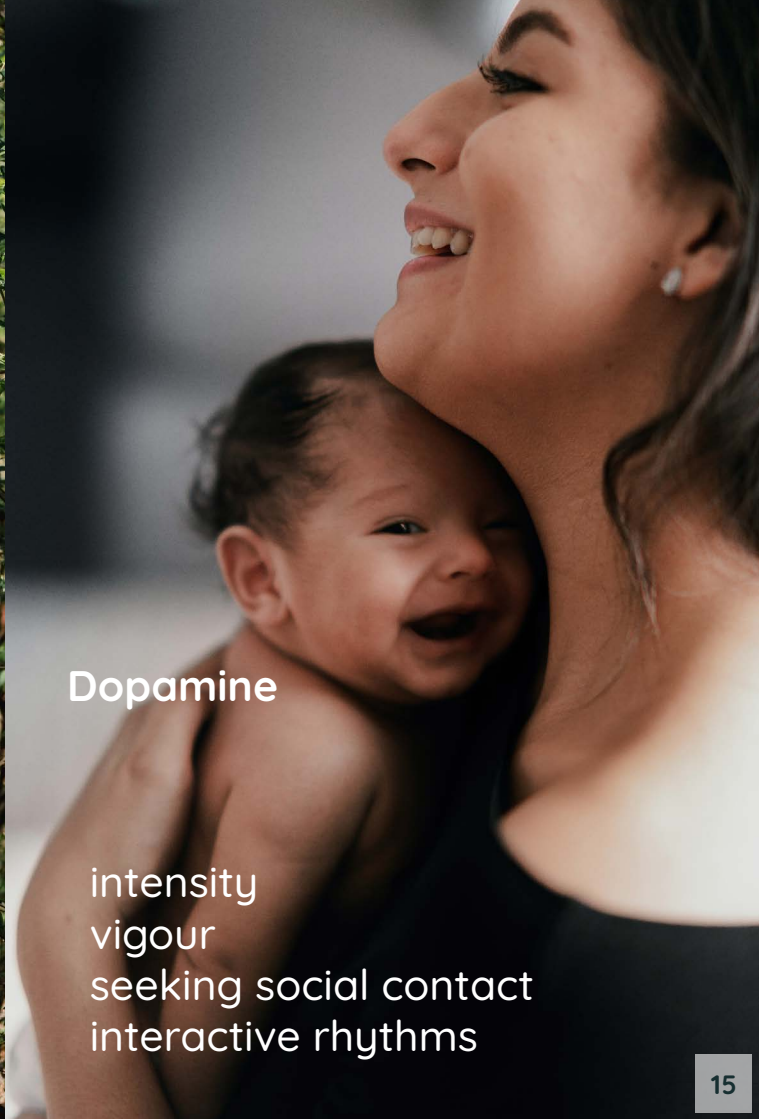
Oxytocin

nurturing
calm
peaceful
safe



Dopamine

intensity
vigour
seeking social contact
interactive rhythms



Connection Network



Oxytocin



Serotonin

The Happy Hormones

Endorphins



Dopamine



Other feel-good hormones associated with Connection include Serotonin and Endorphins. Serotonin is released through nurturing touch and massage. Endorphins are released through song, surprises, and anticipation (e.g., peek-a-boo!) and stimulatory play.

Connection Network

happiness

mood

calm

serenity

Serotonin

(The Well-being Hormone)



Connection Network

euphoria

joy

elation

delight

Endorphins

(Excitement & Pain Alleviating Hormones)



Connection Network

stress
reducing
pain
relieving



Stress-Fear-Pain Network

ACC

= anterior cingulate cortex

AMY

= amygdala

ATP

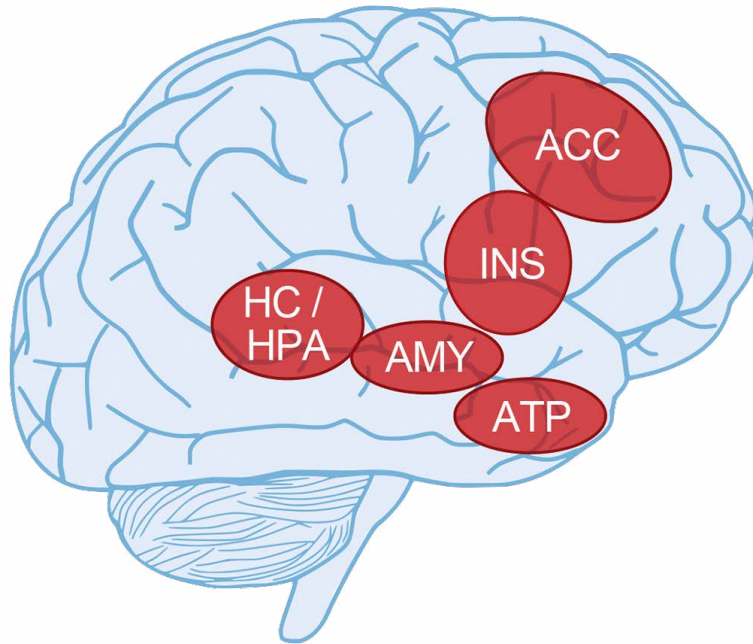
= anterior temporal pole

HC/HPA

= hippocampus/
hypothalamic-pituitary-
adrenal axis

INS

= insula



From 'A functional neuro-anatomical model of human attachment' (2020) – see further reading

Stress-Fear-Pain Network

The Stress-Fear-Pain Network controls the release of hormones which prepare baby's body to respond to perceived threats. It is activated in response to separation, unfamiliar/unexpected events, boredom, discomfort or pain.

Over time, the Stress-Fear-Pain Network can become:

- **over-reactive.** Too frequent or prolonged activations may result in intensified feelings in times of distress, and background feelings of anxiety in times of calm.
- **under-reactive.** Too intense or chronic activations may result in blunted feelings and a lack of responsiveness.
- **optimally-reactive.** Activations in response to everyday stressors that are soothed by a responsive caregiver, result in background feelings of well-being (from the Connection Network) during times of calm.

Activation of the Stress-Fear-Pain Network is a healthy response to distress that helps babies to communicate their needs. We cannot always prevent it, but we can respond to it.

Stress-Fear-Pain Network

tired? over-aroused? craving sensory change? hungry? wet/dirty?
craving contact? lonely?



wind/digestion? uncomfortable?
too hot? too cold?

Stress-Fear-Pain Network

overflowing

intense

incomprehensible

feelings



Stress-Fear-Pain Network

Spectrum of Upset Feelings



grimacing, grunting, jerky movements, flushing, grizzles, frowns

Stress-Fear-Pain Network

Cortisol (The Stress Hormone)



Increases
blood sugar,
heartrate &
breathing



Slows
digestion &
immune
system

Cortisol mobilises bodily resources for a rapid response to threats.

It also slows down systems that are non-essential in an emergency.

It is important to remember that some cortisol is necessary and healthy. Optimal levels keep babies alert, and ensure they respond appropriately to distress when it does occur.

Stress-Fear-Pain Network

fight

flight

freeze

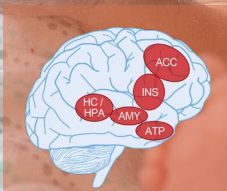
is a healthy, proportional response to an

EMERGENCY

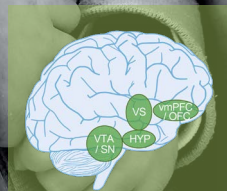
Calming and reassuring babies/toddlers when there is no emergency will help them to (*eventually*) develop a healthy, proportional response to everyday stressors.



In healthy development, there is a 'Push-Pull' between the Stress-Fear-Pain Network and the Connection Network...



Stress-Fear-Pain
Network



Connection
Network

...when one is activated, the other is de-activated...

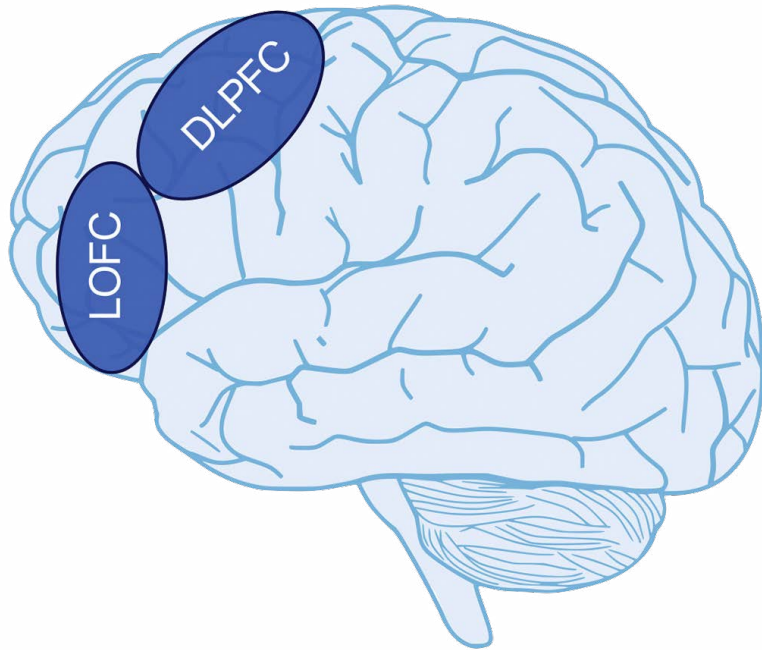
Regulation Network

DLPFC

= dorsolateral prefrontal
cortex

LOFC

= lateral orbitofrontal
cortex



From 'A functional neuro-anatomical model of human attachment' (2020) – see further reading

Regulation Network

Situated in the Frontal Cortex, this network is responsible for:

- coping with emotions
- choosing appropriate responses or behaviours

This network is completely undeveloped at birth, meaning that babies are unable to make sense of their feelings or plan their behaviour.

The development of this network involves repeated instances of 'co-regulation,' whereby parents label their babies'/children's emotions, help them to understand and cope with their feelings, and support them in finding ways to feel better.

Eventually, after many repeated instances of co-regulation, children begin to adopt conscious strategies for managing their feelings and behaviour.

Regulation Network



Soothing

baby shows them that

emotions

are not overwhelming.

- they can be made sense of
- they can be handled
- when I am overwhelmed with stress and fear
my grown up will help me
find ways to feel better

Co-Regulation

The strategies on the following pages for helping toddlers, children (and adults) cope with feelings, are not learned by children on their own.

Rather, they are practised through many repetitions of 'Co-Regulation', whereby a responsive caregiver helps a child
find ways to feel better.

It is important to remember that the stronger the feelings of stress, the less efficiently the child's Regulation Network operates, and the more 'Co-regulation' is needed.

Eventually, after years of practice with their caregivers, children will learn to use these strategies to manage daily stressors independently.

A young girl with blonde hair in a ponytail, wearing a red and white floral dress, stands on a wooden porch. She is looking out through an arched opening at a red barn in a green field. The porch has a wooden railing and a dark wooden roof. The scene is captured in a cinematic style with soft lighting.

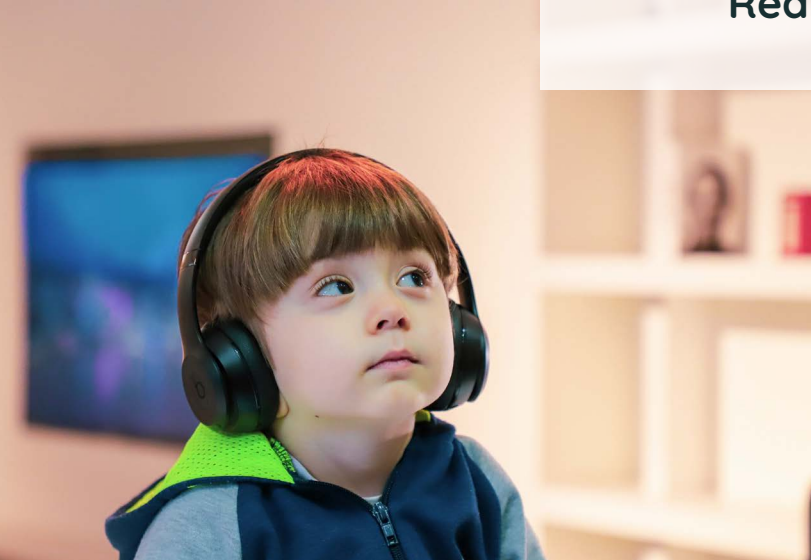
Walk away

A young woman with long blonde hair is lying on her back in a grassy field. She is wearing a purple tank top and black shorts. Her arms are stretched upwards, and her legs are bent at the knees, with her feet held together. She appears to be relaxing or stretching. The background is a soft-focus green field.

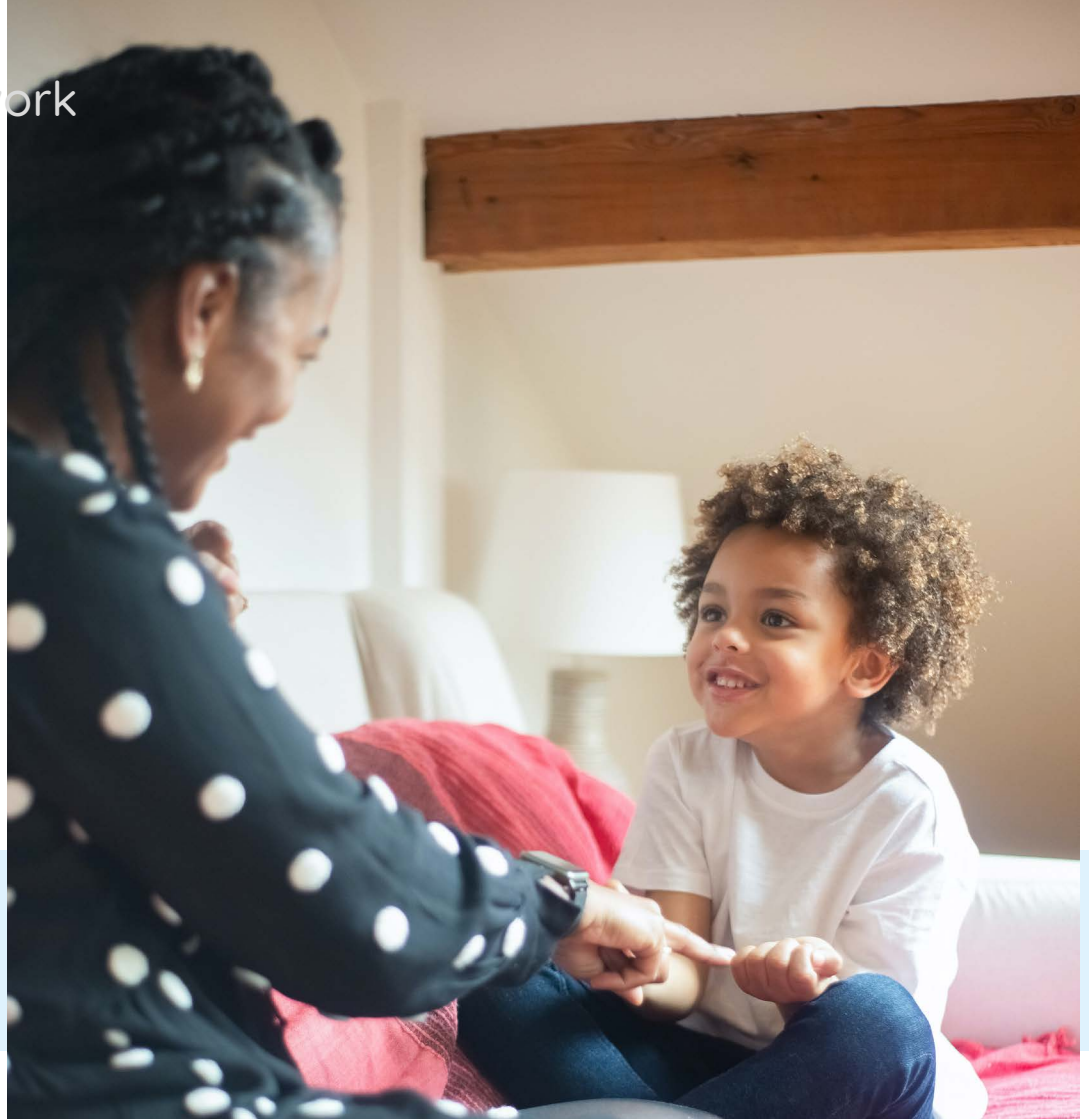
Breathe



Redirect

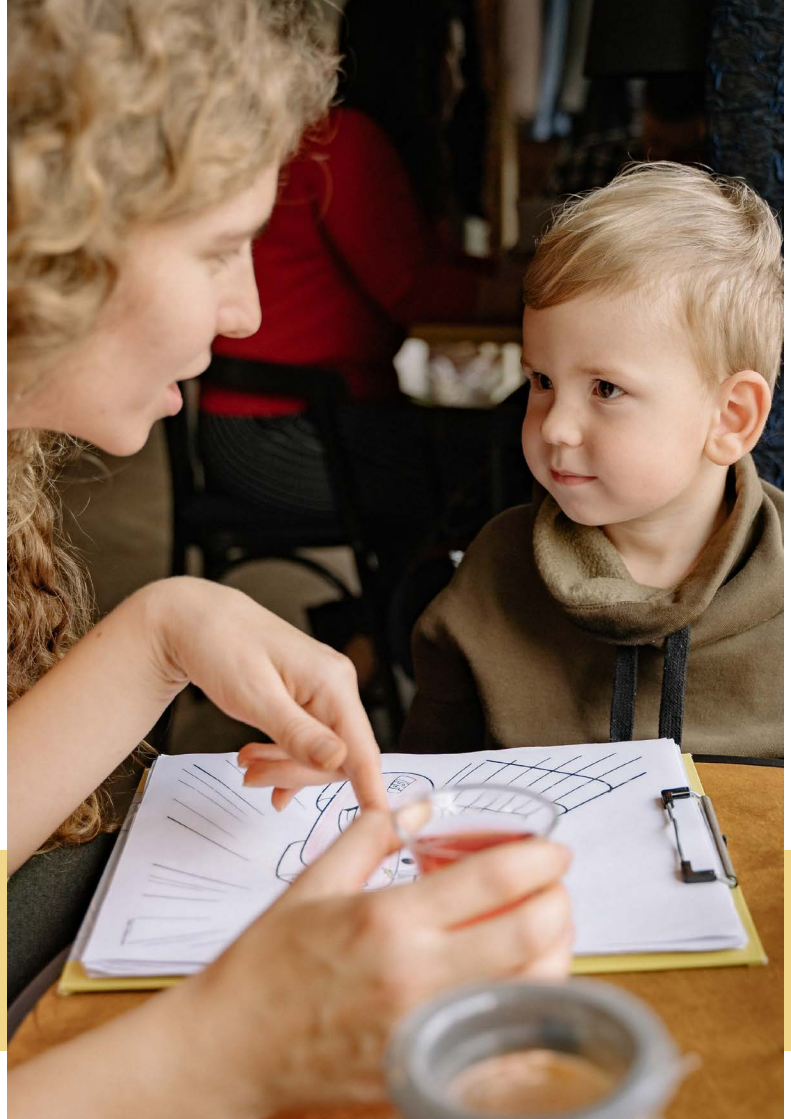


**Talk about
feelings**



Regulation Network

Problem solve



Regulation Network

Tell kinder stories to yourself...



...in which your cup becomes...

half full.



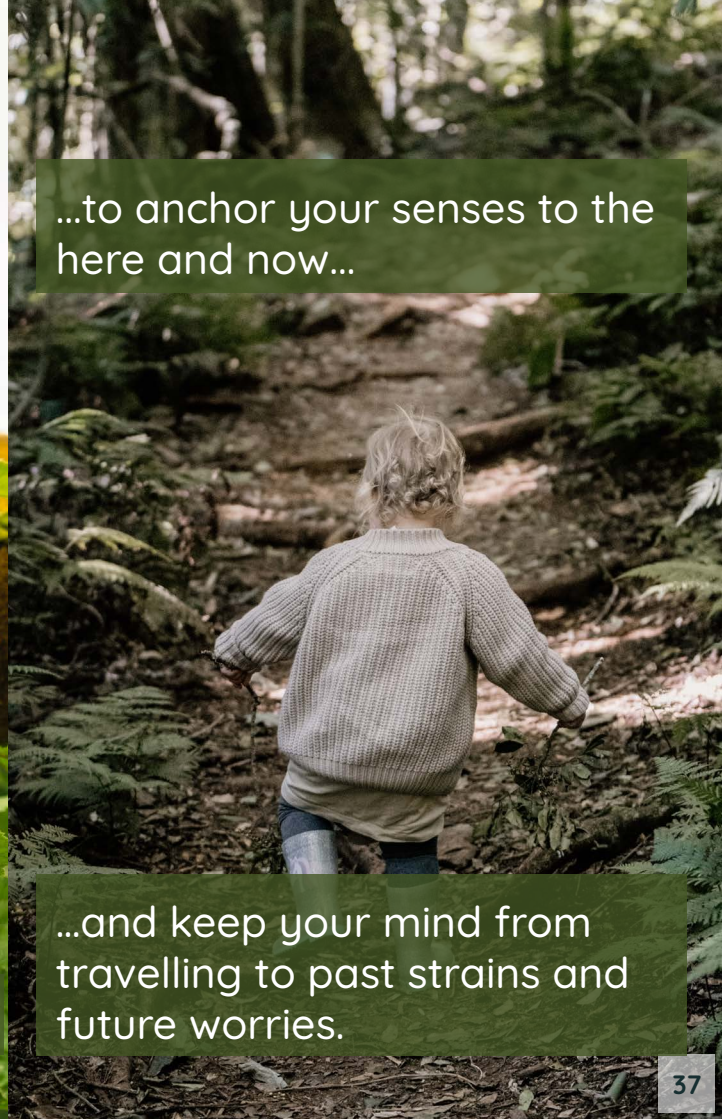
Regulation Network

Mindfulness



Be present in small moments...

...to anchor your senses to the here and now...



...and keep your mind from travelling to past strains and future worries.

Self & Other Network

aSTG

= anterior superior temporal gyrus

FG

= fusiform gyrus

MPFC

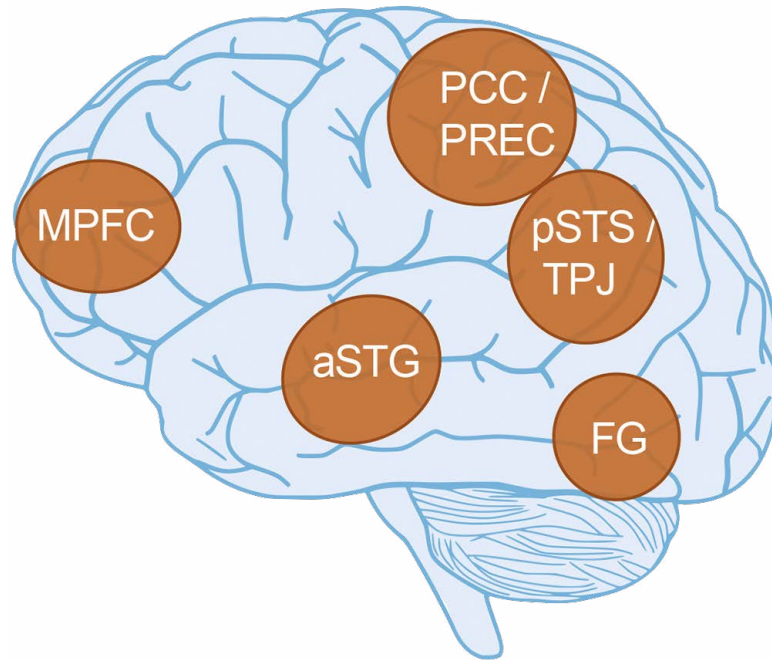
= medial prefrontal cortex

PCC/PREC

= posterior cingulate cortex/ precuneus

pSTS/TPJ

= posterior superior temporal sulcus/ temporo-parietal junction



From 'A functional neuro-anatomical model of human attachment' (2020) – see further reading

Self & Other Network

This network governs how babies/toddlers perceive themselves and what they expect from others.

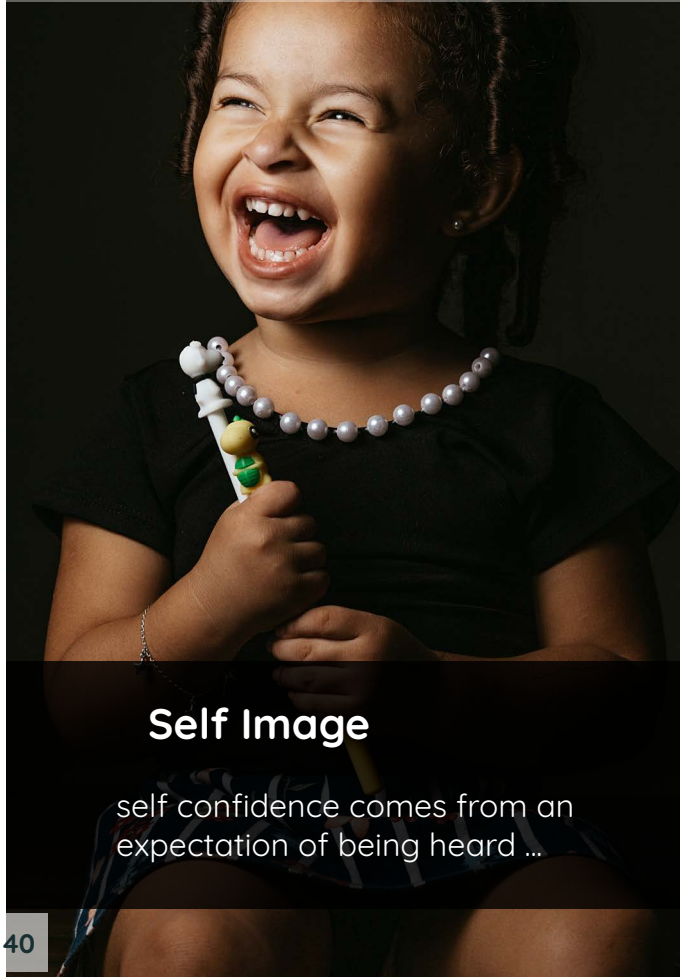
It's optimal development (through CHATS – see next section) enables babies and toddlers to see the world through the eyes of other people.

This underpins their capacity for:

- empathy
- cooperation
- taking the perspectives of others

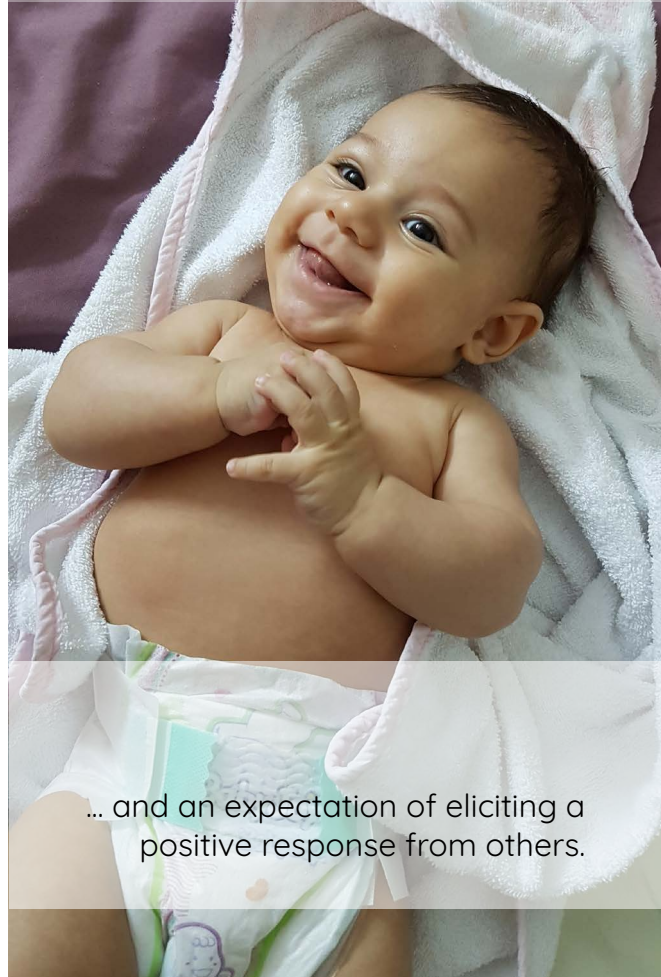
The Self & Other Network also acts to promote group cohesion and a sense of belonging to one's 'tribe'.

Self & Other Network



Self Image

self confidence comes from an expectation of being heard ...



... and an expectation of eliciting a positive response from others.

Self & Other Network



Others are viewed as helpful and cooperative, with good intentions.

How the Self & Other Network Develops

Through responding sensitively to babies' cues and communications (see 'Cues', in next section on CHATS) they develop a positive image of themselves and an expectation of cooperation from others.

Through partaking in turn-taking, non-verbal, exchanges (see 'Synchrony', in next section on CHATS) babies come to understand that they can emotionally affect, and be affected by, others.

Through talking to babies about what they may be thinking or feeling (see 'Talk', in next section on CHATS) they begin to make sense of their own and others' feelings.

Together, these three elements of CHATS tune babies and toddlers in to the feelings, needs, interests and goals of others.

This enables a capacity for empathy,
and motivates cooperation.

Self & Other Network

exchanging
emotions

being affected by

and

affecting

another's feelings

A black and white photograph of two young girls sitting on a beach, laughing heartily. They are both covering their mouths with their hands. The girl on the left is wearing a striped off-the-shoulder top, and the girl on the right is wearing a light-colored dress. The background shows a sandy beach with some driftwood.

reading
body
language

engaging in
non-verbal
communication

Self & Other Network

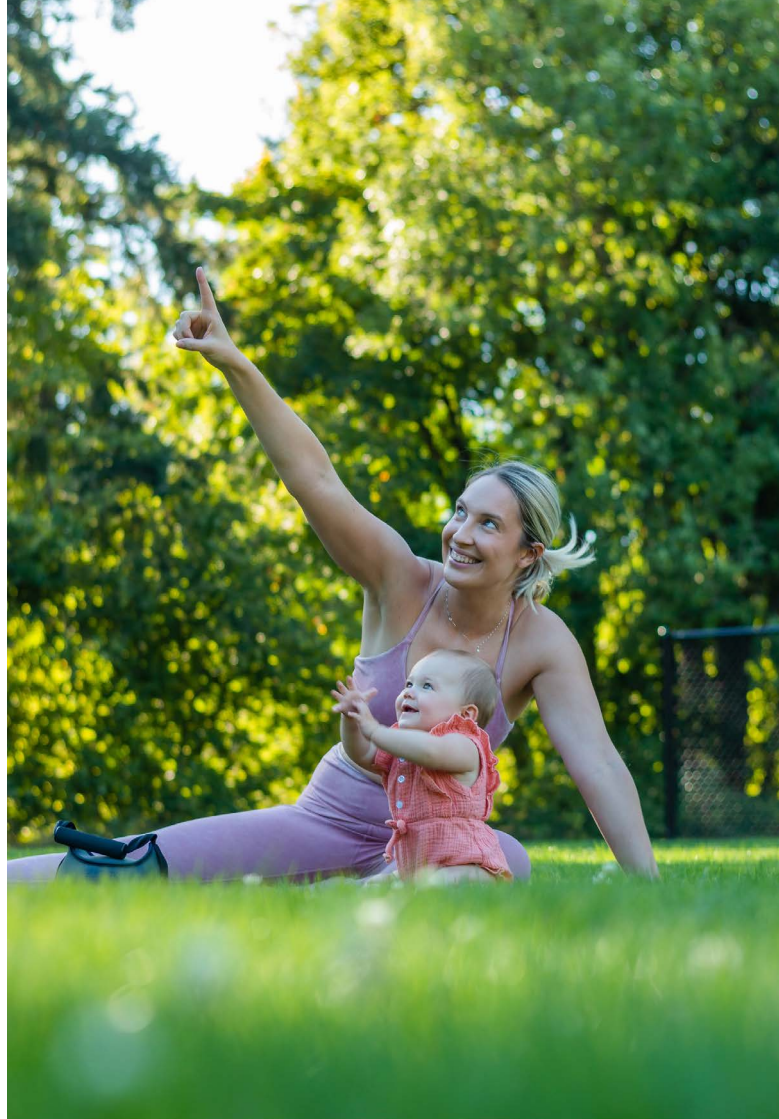
understanding others'



feelings
needs
desires
beliefs

Self & Other Network

sharing
attention
and
interest



Self & Other Network

aligning
with
others'
goals



Self & Other Network

joint purposes
and
shared
meaning



Self & Other Network

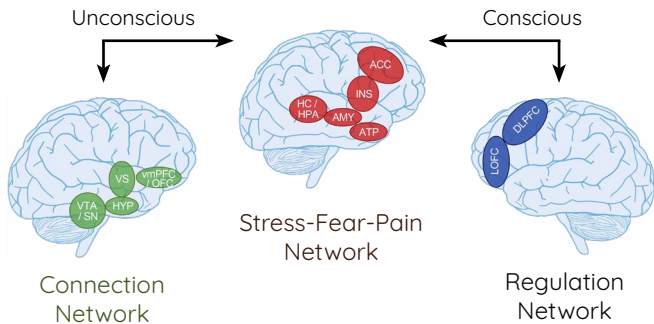
cooperation



The brain networks working together

in a typical, healthy child, who has been enriched with CHATS

in response to STRESS



The unconscious response to stress is for the **Connection Network** to be activated and for the child to seek out comfort in others.

The conscious response to stress is to attempt to **regulate** feelings and behaviour using strategies that have been previously practised (through co-regulation) with a sensitive caregiver.

Both routes lead to **deactivation** of the **Stress Network**.



The brain networks working together

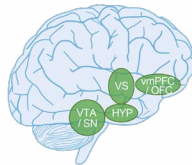
in a typical, healthy child, who has been enriched with CHATS

in response to OTHERS

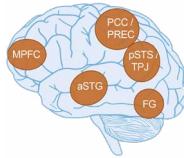
Social interaction with caregivers activates the Connection Network and is experienced as intensely rewarding.

Non-verbal communication, underpinned by the Self & Other Network, is effortless and flowing. The child naturally aligns with the feelings, needs and goals of others and feels motivated to cooperate.

They have developed a confident image of self and an expectation of validation and support from others.



Connection
Network



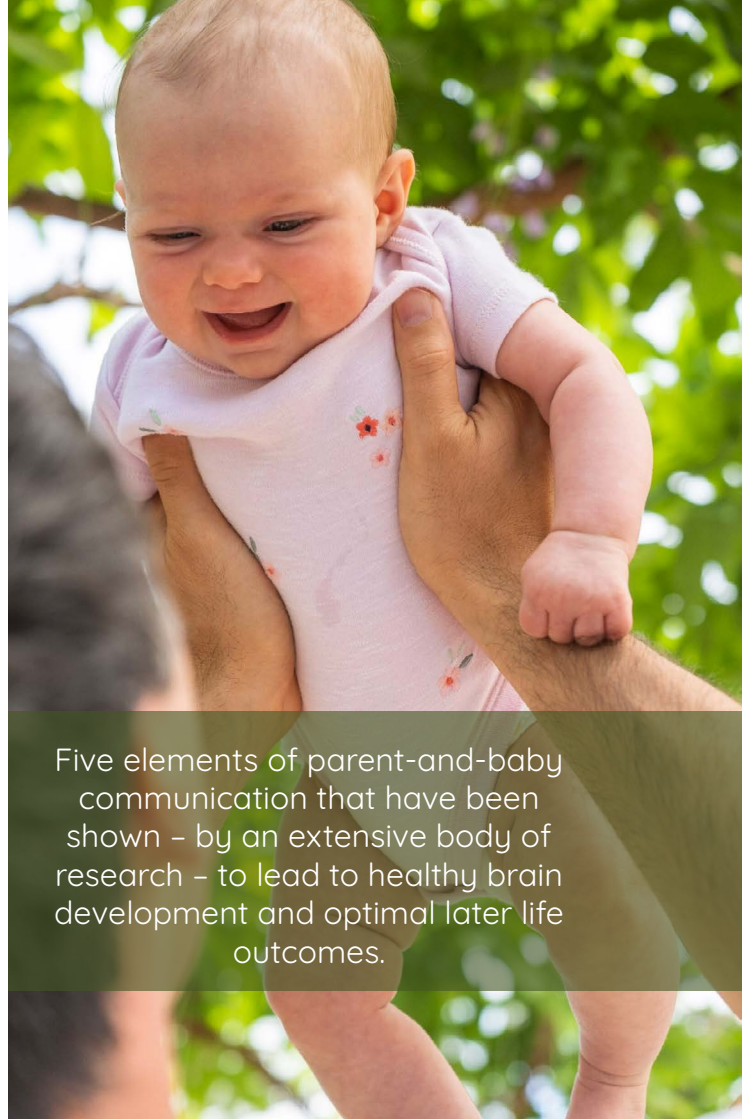
Self & Other
Network





Section Two

- Cues
- History
- Attachment
- Talk
- Synchrony



Five elements of parent-and-baby communication that have been shown – by an extensive body of research – to lead to healthy brain development and optimal later life outcomes.

CHATS

These five elements of parent-and-baby communication have been shown, through a comprehensive body of work stretching back over 50 years, to link to optimal life outcomes.

Such outcomes relate to the ability to maintain deep and committed relationships and a sense of connection to others.

They also include a capacity for compassion, the ability to take the perspectives of others and the willingness to help and cooperate.

Further, these outcomes comprise measures of physical and mental health, including resilience to stress and wellbeing.

Indeed the biggest predictor of mental health conditions in children is the number of Adverse Childhood Events (ACEs) that a child has experienced.

Examples of ACEs are living in a family with financial difficulties, moving home or school, grief, family illness, parental separation or witnessing domestic abuse.

Research consistently shows that parent-and-baby relationships enriched with CHATS buffer and protect against the effects of ACEs, limiting their impact on mental health.

Deep and lasting relationships



Resilience



Enriched with CHATS

Sense of community,
compassion, connection



Flexibility & positivity
in the face of stress



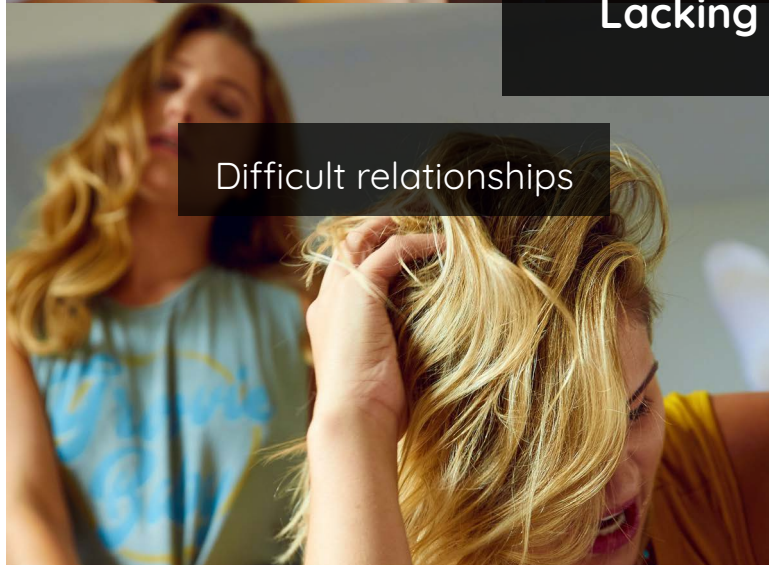


Anxiety

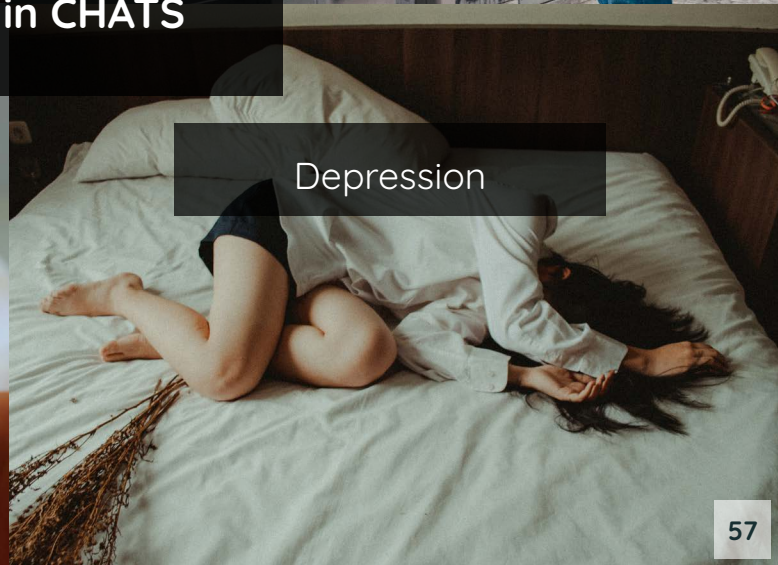


Anger

Lacking in CHATS



Difficult relationships



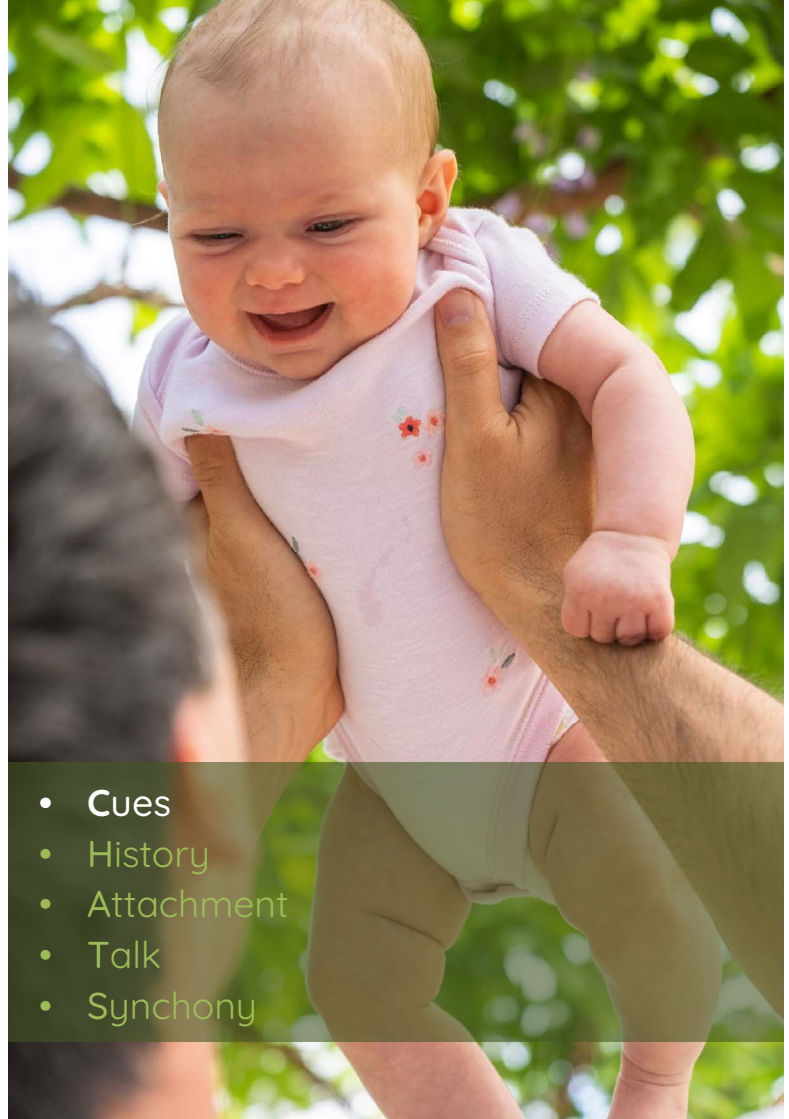
Depression

Cues

Reading and responding to baby's cues and communications.

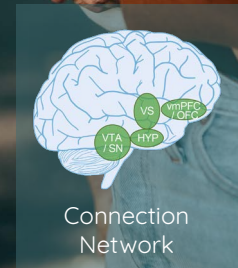
Look through the following pictures and think about:

- What is baby is trying to communicate?
- What would your response be?
- How satisfied is baby with the response they received?



- Cues
- History
- Attachment
- Talk
- Synchrony

Comforting baby when distressed ...

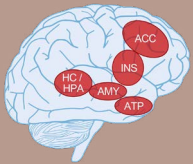


... and encouraging curiosity and exploration when they show interest ...

... rewards the brain with hormones that help baby to feel safe on one hand, and a capacity for learning and joy on the other.

Cues

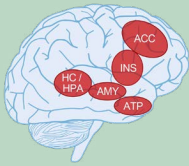
Responding to babies' smallest cues and communications ...



Stress-Fear-Pain
Network

Cues

... moderates development
of the Stress Network,
as they learn they have
the power to elicit help.

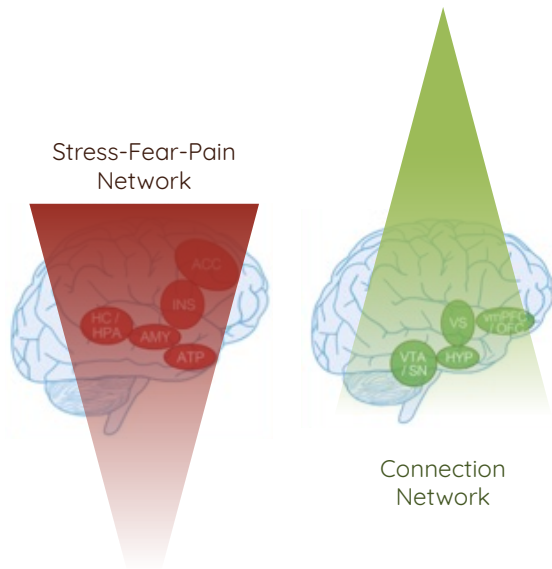


Stress-Fear-Pain
Network



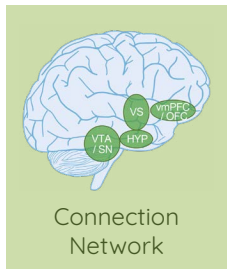
Cues

Over repeated instances, set points for daily cortisol are reduced and set points for 'Happy Hormones' (from the Connection Network) are increased, leading to background feelings of happiness and wellbeing.



Cues

Following baby's
lead or interest...



Cues

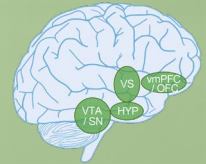


... and encouraging
curiosity ...

Cues

... activates hormones
involved in

autonomy
learning
&
pleasure.



Connection
Network

Cues

Showing babies that
their emotions can be
expressed and understood ...



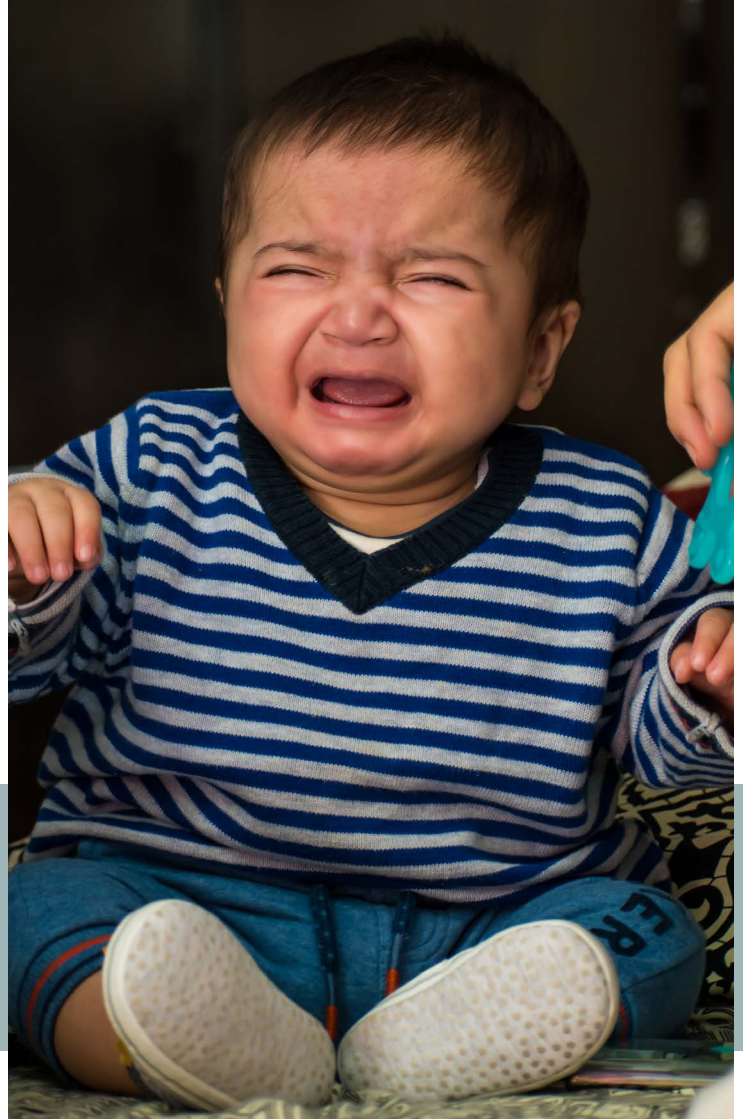
Regulation
Network



Cues

... that their feelings
need not be overwhelming

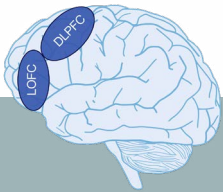
and that even when things
go wrong, there are ways to
feel better together ...



Cues

... helps them to develop resilience,

an assurance that they can cope with
and have some control
over their emotions and their
circumstances throughout life.

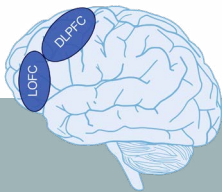


Regulation
Network

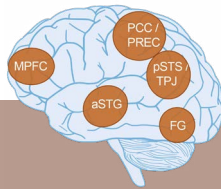


Cues

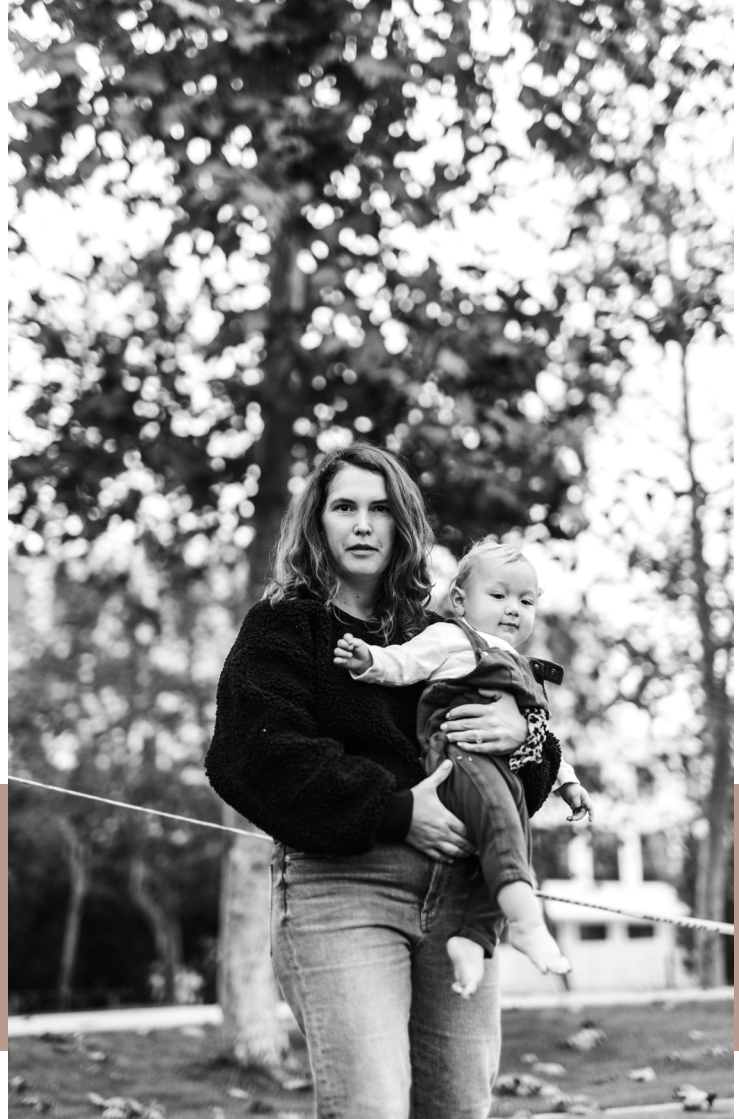
Healthy communication is not about being perfectly attuned ...



Regulation
Network

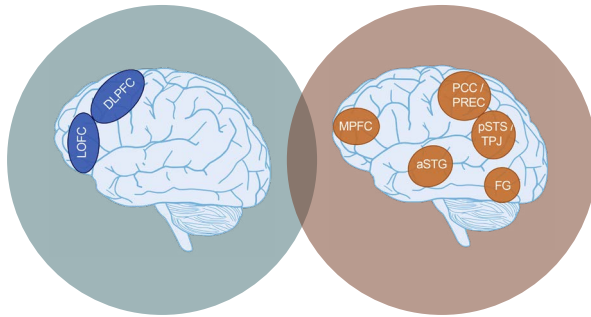


Self & Other
Network



Cues

... there are often ruptures



Regulation
Network

Self & Other
Network



Cues

... and repairs.

These build

trust

and

confidence

that everything can always

be
made
right.



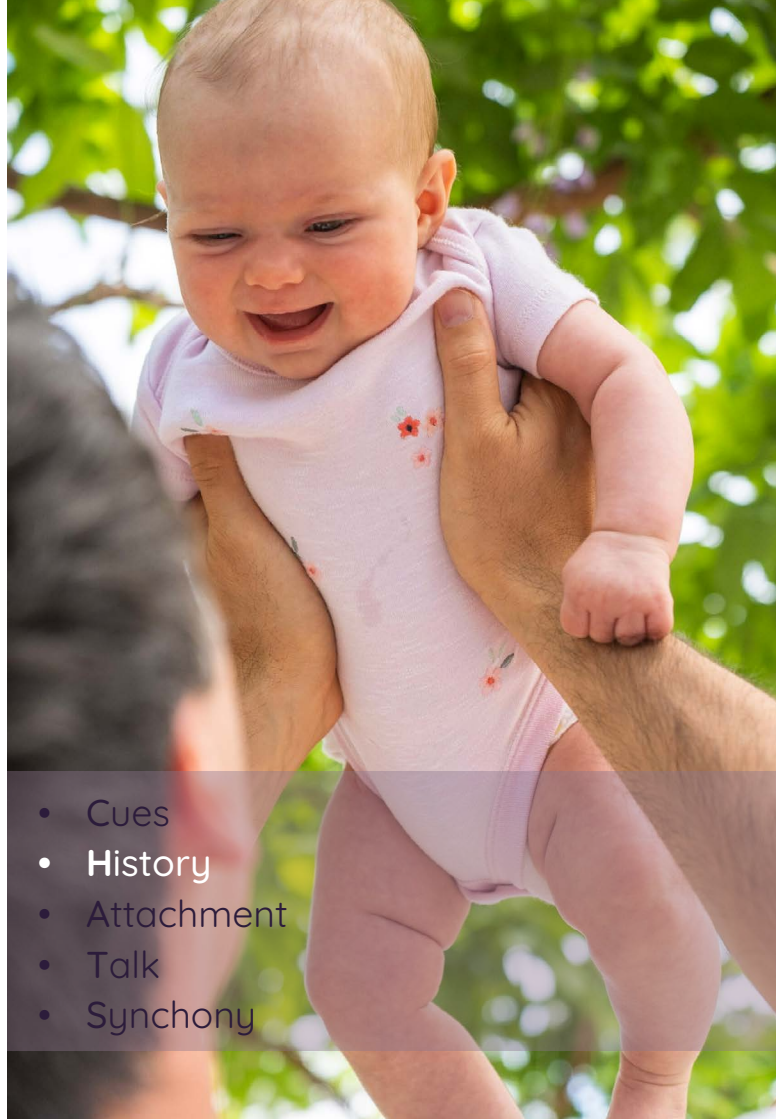
History

Making sense of your early relationships with your own parents.

Look through the following questions and think about what your responses would be.

Perhaps talk through your answers with a close friend or loved one.

- Cues
- **History**
- Attachment
- Talk
- Synchrony



Adult Attachment Interview

I'd like to ask you to choose five words that reflect your relationship with your mother (or father) starting from as far back as you can remember in early childhood.



The first word you used was

.....

Can you think of a memory or an incident that would illustrate why you chose that word to describe the relationship?

In general, how do you think your overall experiences with your parents have affected your adult personality?

George, C., Kaplan, N., & Main, M. (1996). Adult attachment interview.

History

Secure
(Coherent)



Insecure
(Incoherent)



Our relationships with our parents need not necessarily directly impact our relationships with our children.

Rather, it is how we make sense of those early relationships that matters.

A close-up photograph of a man, a woman, and a baby laughing together outdoors. The man on the left has a beard and is wearing a dark beanie. The woman in the center has dark hair and is wearing a purple top. The baby on the right is wearing a pink and white striped knit hat. They are all smiling and laughing, with their faces close together. The background is a blurred outdoor setting.

History

Even if we ourselves did not receive an optimal dose of CHATS, reflecting on how this has made us into the people we are today helps us to take positives forward into our relationships with our own children.

Attachment

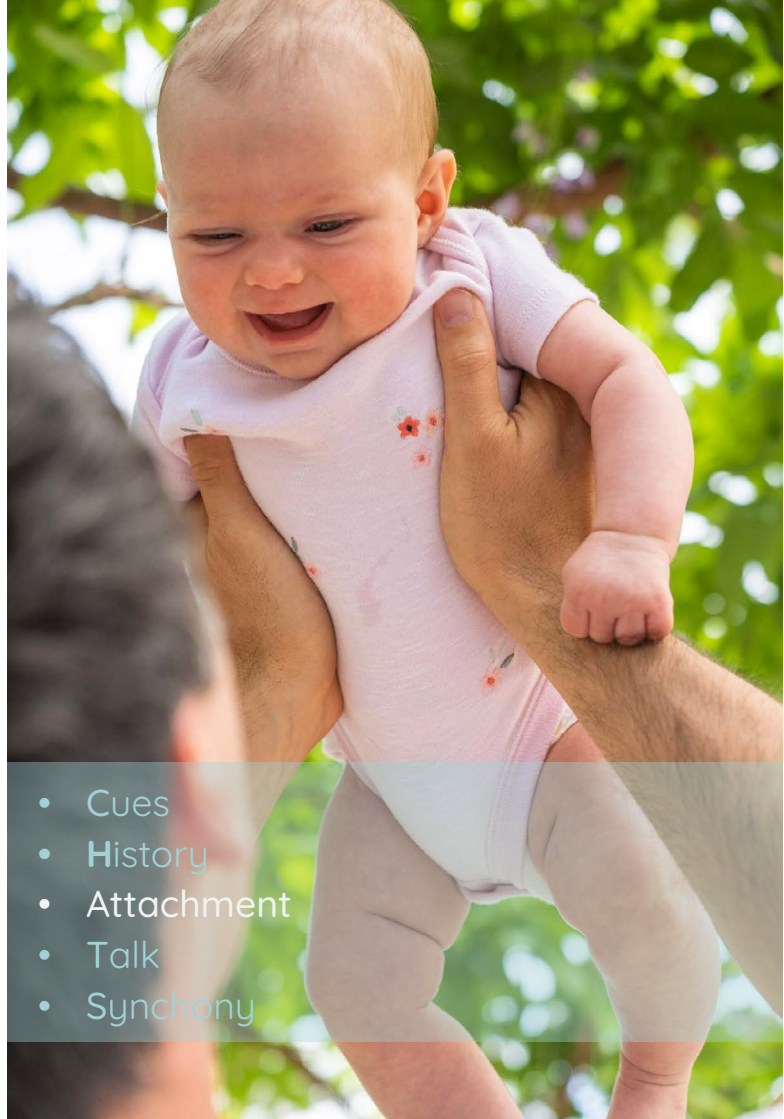
Attachment is a measure, in developmental research, of the relationship between parent and baby

Babies who are enriched with CHATS are those who are most likely to be **Securely Attached** and their brain development will proceed as in the first section of this book.

Babies who are - to greater or lesser degrees - not enriched with CHATS are those who are most likely to be **Insecurely Attached**.

In what follows, we can see how the brains of these babies may develop differently.

- Cues
- History
- Attachment
- Talk
- Synchrony



Attachment

Attachment Styles

Secure 55-60% of the population	Avoidant 30% of the population	Anxious 10-15% of the population
---------------------------------------	--------------------------------------	--



Avoidant Attachment

Pushes away feelings

Pushes away other people



Avoidant Attachment

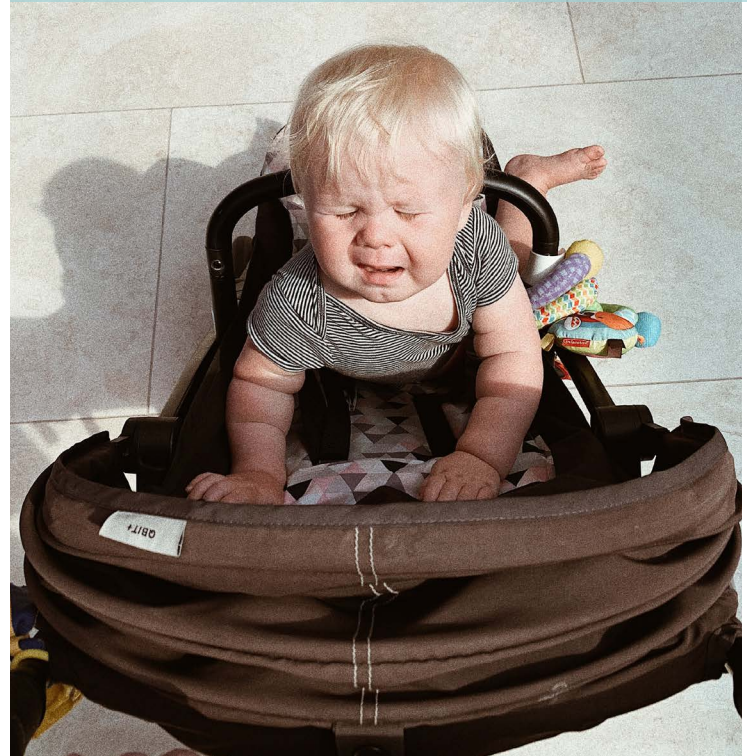
Dismissive or Detached Parenting

An Avoidant Attachment style arises from 'Dismissive' or 'Detached' parenting whereby the baby/toddler – to varying degrees – is left to deal with their own feelings or has their feelings denied.

This is often well-intentioned and comes about through misinformation about how to best promote independence.

There is often a misconception that babies/toddlers use their big feelings or 'tantrums' to manipulate adults.

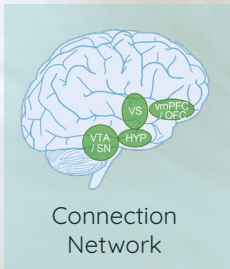
baby or toddler
discouraged from expressing
'big feelings'
and when they do
these feelings are not validated



Avoidant Attachment

stop
seeking
comfort.

When baby's subtle communications are not responded to they learn - to greater or lesser degrees - that they must deal with stress alone. They become **under-reliant** on the Connection Network

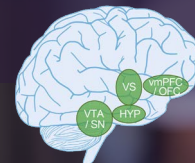


Avoidant Attachment

self contained

Connection with others is experienced as less rewarding.

Rather than seek out help, they are inclined to deal with problems alone



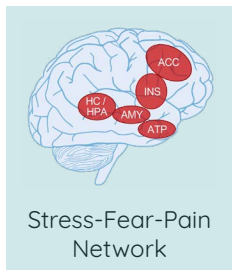
Connection
Network

Avoidant Attachment

During times of distress, those with an Avoidant Attachment Style work very hard to de-activate the Stress Network (using 'Self-Regulation' Strategies, illustrated on the following pages).

These strategies are often only partially successful, and when stress is felt, it may be felt more keenly than those who are Securely Attached.

Conversely, some social stressors that are known to be painful to the majority of people – rejection and exclusion – are felt less keenly by Avoidants.



Indeed, one aim of de-activating the Stress Network for Avoidants, is to reduce the chances of approach or help from others – which in itself, may be experienced as stressful.

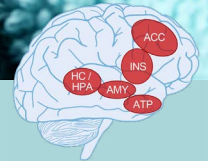


De-activate

Avoidant Attachment

During times of calm, those with an Avoidant Attachment Style may experience background feelings of vigilance and anxiety, rather than wellbeing.

Since baby has dealt, and must deal, with small or not-so-small stressors and feelings on their own, the Stress Network becomes heightened for early detection.



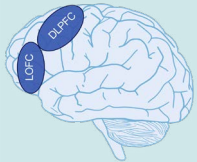
Vigilant

Stress-Fear-Pain
Network

Avoidant Attachment

Self Regulation Strategies

Without co-regulation from a responsive caregiver, less-than-optimal ‘self-regulation’ strategies are developed in an attempt to reduce stress

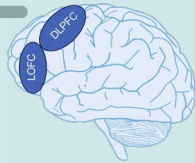


Regulation
Network

Avoidant Attachment

Inhibition

Hide
feelings
to
push
other
people
away

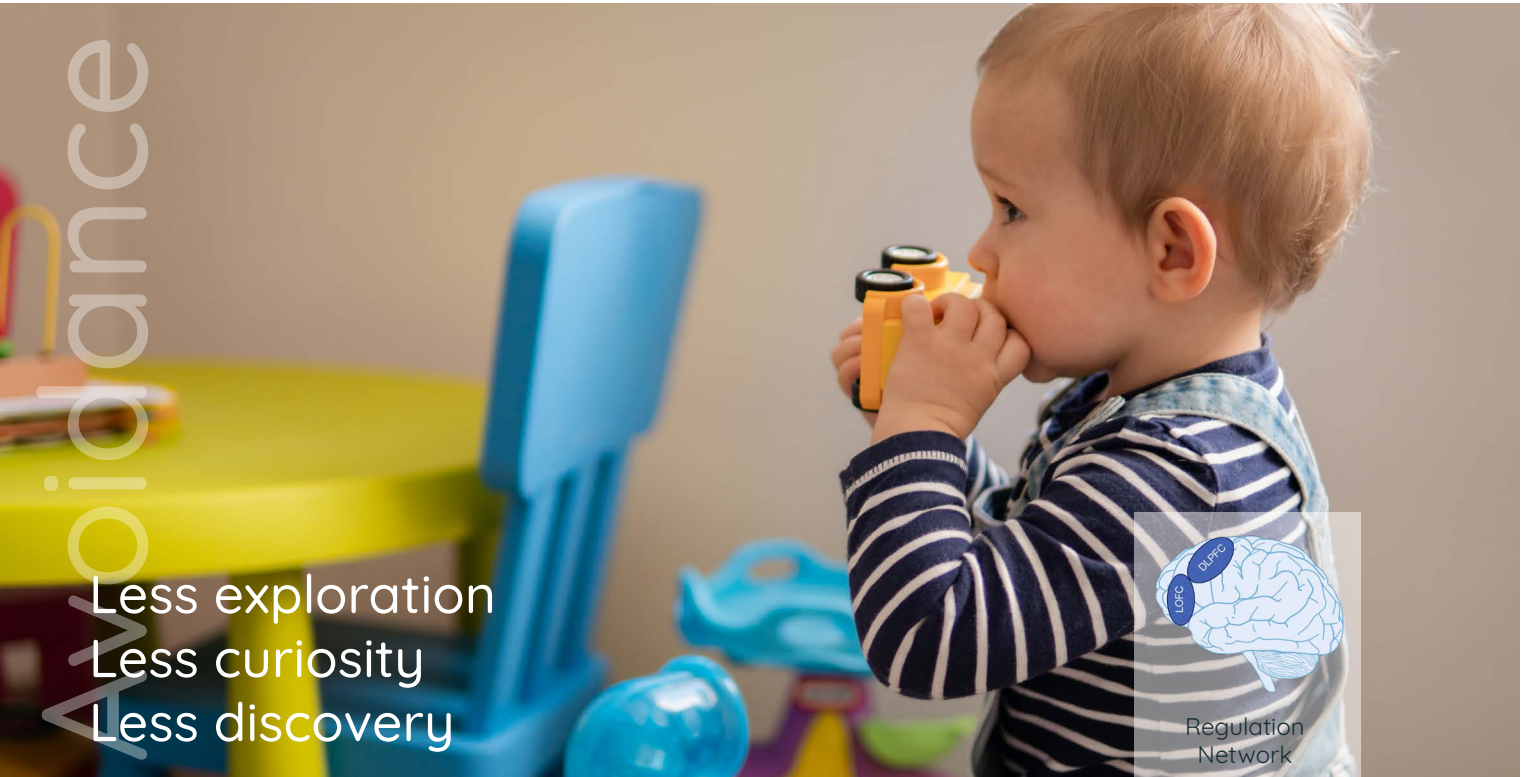


Regulation
Network



Avoidant Attachment

When others cannot be relied on to help manage stress,
situations that may pose a threat are avoided

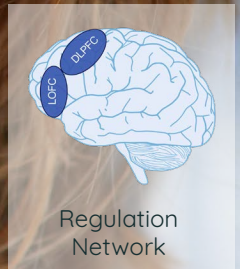


Avoidant Attachment

In order to reduce stress, feelings are pushed away,
rather than talked through and worked through

suppression

Push away feelings

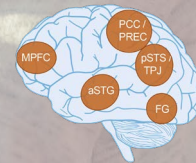


Avoidant Attachment

Self Image

less confidence
in ability to elicit
positive
or empathic
responses
from others

Don't expect to be heard



Self & Other
Network

Avoidant Attachment

If regulation strategies (suppression, inhibition, avoidance) are successful in managing stress, then self-image may be fairly positive. There is a sense, however, that one must look out for oneself. Others are viewed as unhelpful, with negative intentions.

Other Image

Untrusting
Interpret others'
intentions negatively



Self & Other
Network

Anxious Attachment

Expresses big feelings intensely

Appears clingy or needy

Becomes easily upset
or angry with other people



Anxious Attachment

Intrusive or Inconsistent

An Anxious Attachment style arises from 'Intrusive' parenting, whereby the caregivers' interactions with the baby/toddler are – to varying degrees – led 'by the clock' or solely directed by the caregiver.

At the same time, the baby's own 'cues' or communications are often missed or misread.

This is often well-intentioned and comes about through a belief in the need for strict routines.

Anxious Attachment also comes about through 'Inconsistent' responses to baby's/toddler's communications – sometimes their needs are met, often they are not.



feelings of helplessness

occur when baby or toddler has little control or autonomy (**Intrusive**) or when they are unsure whether or not their needs will be met (**Inconsistent**)

Anxious Attachment

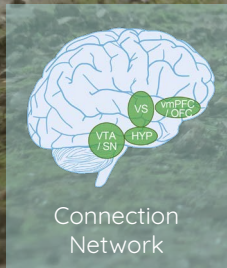
Lack of autonomy and feelings of helplessness lead to over-reliance on caregiver presence, even though needs are often not met



Anxious Attachment

Attention-seeking?

or



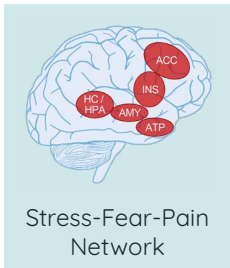
Connection-seeking?

Anxious Attachment

During times of distress, those with an Anxious Attachment Style use 'Self-Regulation' to over-activate the Stress Network.

Over-activate

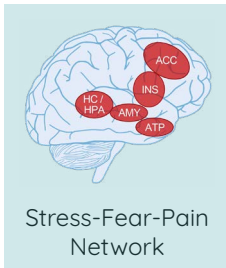
Stressful events are experienced as more painful, and are expressed more intensely than for those who are Securely Attached.



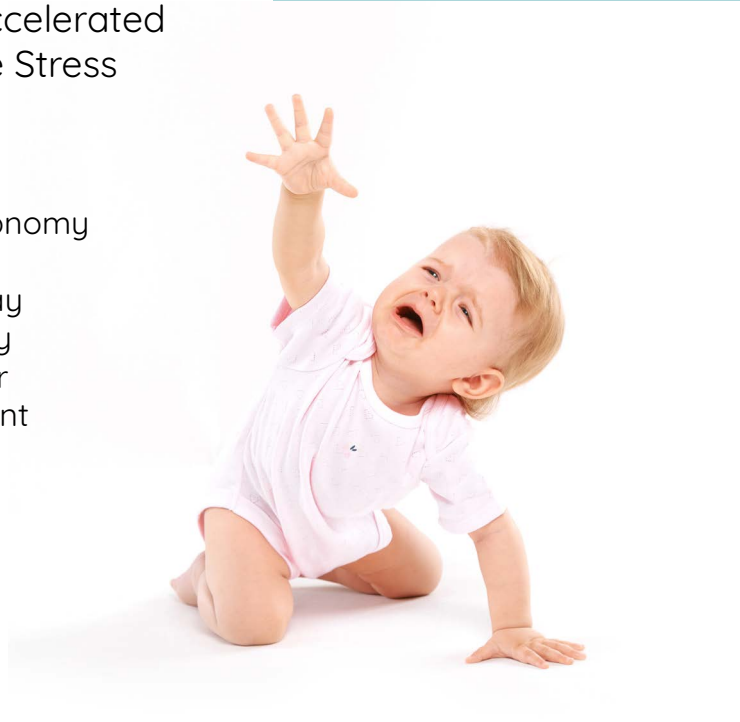
Anxious Attachment

During times of calm, those with an Anxious Attachment Style may be fretful, due to accelerated development of the Stress Network.

Since baby has experienced little autonomy or control over their environment, they may become fearful of any situation in which their caregiver is not present



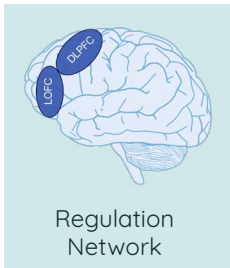
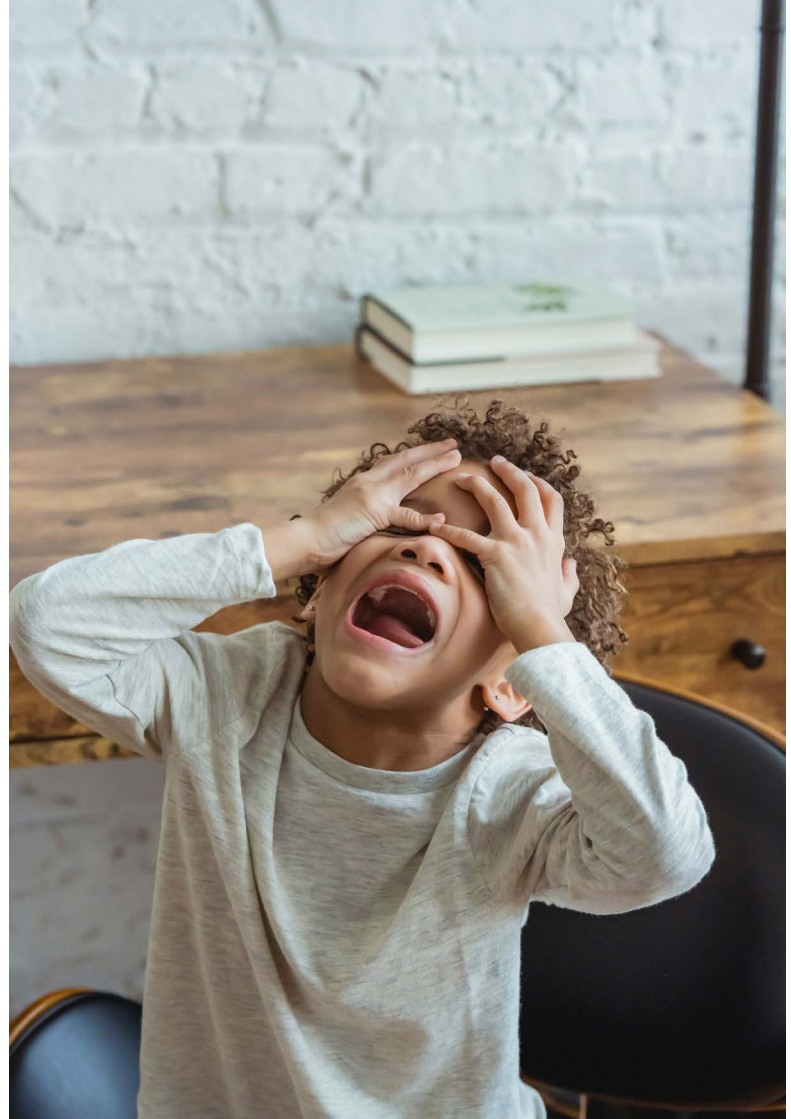
fearful



Anxious Attachment

Intensify emotions and behaviour

In contrast to Avoidants, who downplay emotions to avoid connection with others, those who are Anxiously Attached intensify emotions in order to gain connection with others.

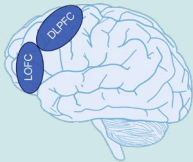


Anxious Attachment

few tools

Over-reliance on caregivers who provide fewer experiences of co-regulation, may result in the Anxious child failing to develop any helpful strategies for managing feelings and behaviour.

(Avoidants, by contrast, at least develop some self-regulation strategies for managing stress. However, these are often only partially successful.)



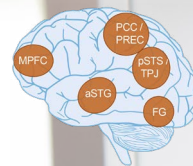
Regulation
Network

Anxious Attachment

lack of confidence in own abilities & fragile sense-of-self

Self Image

Dependent upon
others' approval



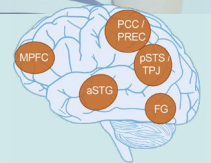
Self & Other
Network

Anxious Attachment

Other Image

Ambivalent

needs others
to feel secure
yet doesn't expect
needs to be met



Self & Other
Network

A little more on Insecure Attachment

It is important to emphasise that Insecure Attachment is not intrinsically 'bad', but an adaptive response to the parenting style that a baby or toddler receives.

For Avoidant Attachment, a child who does not have their big feelings soothed (through activation of the Connection Network) and co-regulated (by having an adult help them cope with their emotions and find ways to feel better), can best manage stress by avoiding connection with others and developing strategies for downplaying their feelings through self-regulation - even if these strategies are less than optimal.

For Anxious Attachment, a child who lacks autonomy and is unsure whether or not their needs will be met is best served by exaggerating and amplifying their feelings, in order to increase the chance of eliciting help and activating the Connection Network.

These strategies often persist as our children grow and become a blueprint for how they deal with stress and how they make relationships with others. Comprehending this allows us to gain understanding of those who may relate differently to ourselves, and helps us to reflect on our own patterns of responding to life's events, and relating to others.

Disorganised Attachment

Beyond Secure and Insecure Attachment, babies may also be classified as 'Disorganised' in their Attachment Style.

This means that the child is unable to form a coherent strategy for relating to their caregiver, in order to manage stress.

It may come about when –

- the caregiver is themselves a source of threat (abuse),
- when intense or chronic early stress in life is not alleviated by a caregiver (neglect),
- when the family is living with multiple social and economic disadvantages (creating a stressful home environment that impacts the parent-infant relationship)

Around 15% of the general population is classified as Disorganised, but this rises to more than 30% for at-risk groups (e.g., adopted children, or parents affected by social-economic disadvantage, diagnosed with mental health conditions, or who have themselves been neglected or abused).

Disorganised Attachment has even stronger links than Insecure Attachment to later-life (mental) health conditions and difficulties maintaining relationships. It is also linked to outcomes such as drug or alcohol abuse, domestic abuse, self-harm and criminality.

Research shows that interventions in which parents view the positive moments of their relationship with their infant (often using video feedback) and build upon these, can be effective in creating attachment security.

Talk

Talking to baby about what they may be feeling or thinking

Research shows that when we respond to babies' cues, if we also say out loud what we imagine they are thinking or feeling, then this becomes an even stronger prediction of **Secure Attachment** and optimal later-life outcomes.

After looking at this section, go back to the section on 'Cues' and imagine what you would say to the babies featured there, about what they are thinking and feeling.

- Cues
- History
- Attachment
- Talk
- Synchrony



Talk

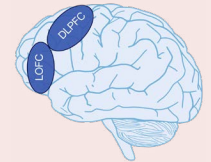


Talking about what our babies may be thinking or feeling

even before they recognise the words

helps them learn that emotions have names

and that their feelings can be understood and made sense of.

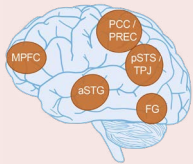


Regulation
Network

Talk

Narrating baby's thoughts and feelings helps them to understand the thoughts and feelings of others.

This leads to empathy and the ability to take another person's perspective.



Self & Other
Network

Talk

talk

about what

baby

is

thinking

or

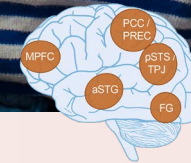
feeling

...

‘Oh you didn’t want me to
take the toy’

‘Oh you wished I would
give the toy back’

‘Oh you are so sad because
you really like this toy’



Self & Other
Network



Regulation
Network

Talk

... then toddlers will

talk

about

thoughts

and

feelings

...



‘Daddy happy’
‘Maisy want lolly’
‘Me sad’

Talk

...
and teenagers will

talk

to express
empathy,

see others'
perspectives,

change their
minds

&

find solutions.



Regulation
Network

Self & Other
Network

Synchrony

‘Turn-taking’ exchanges, involving eye contact, facial expressions, gestures and vocalisations

Initially parents structure and scaffold these ‘conversations’, leaving space for baby to respond.

By around 4-months-of-age, however, babies are increasingly able take the lead and become equal conversational partners.

There are three hallmarks of Synchrony that are linked to Secure Attachment and healthy brain development:

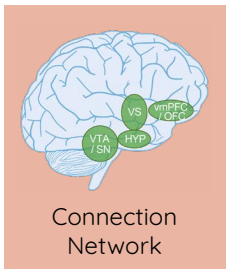
- becoming more positive together
- allowing baby to look away then reconnect
- mirroring baby’s distress



- Cues
- History
- Attachment
- Talk
- Synchrony

Synchrony

The capacity for synchrony rests upon biological rhythms which are matured through close contact.



Synchrony

Many parents notice their babies beginning to communicate at around 4-6 weeks of age.

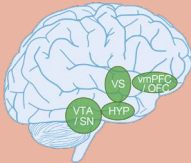
Amazingly however, the capacity to hold gaze and mirror parents' expressions is present, in small moments of quiet alertness, from birth.



Synchrony

mutual gaze

Baby and caregiver's brains are flooded with feel-good hormones, during mutual eye gaze and synchronous exchanges.



Connection
Network

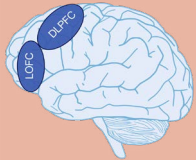


Synchrony

exchanging gestures, expressions & vocalisations

Baby learns to organise their actions – when to wait and when to respond.

These are important skills for gaining voluntary control over their arousal and behaviour.

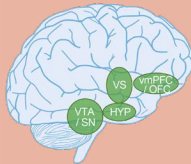


Regulation
Network

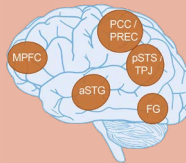


Synchrony

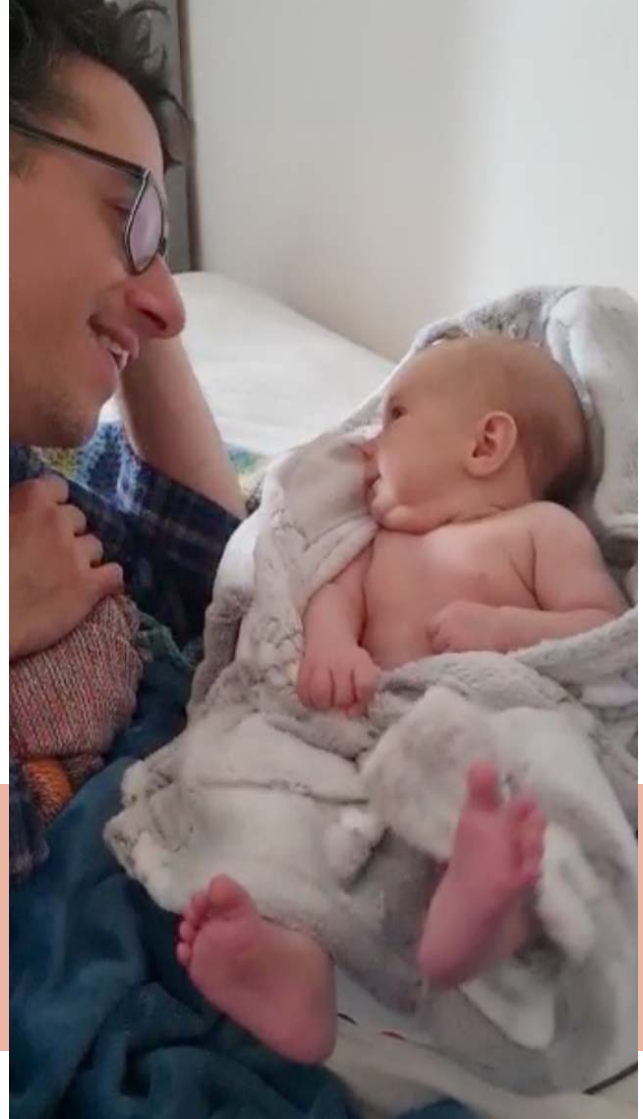
Becoming...



Connection
Network

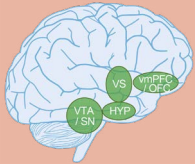


Self & Other
Network

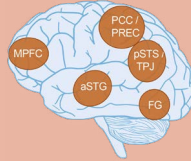


Synchrony

more positive...



Connection
Network



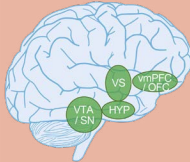
Self & Other
Network

Synchrony

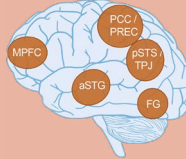
together.

Caregiver guides and scaffolds baby's emotional state towards positive feelings and Connection.

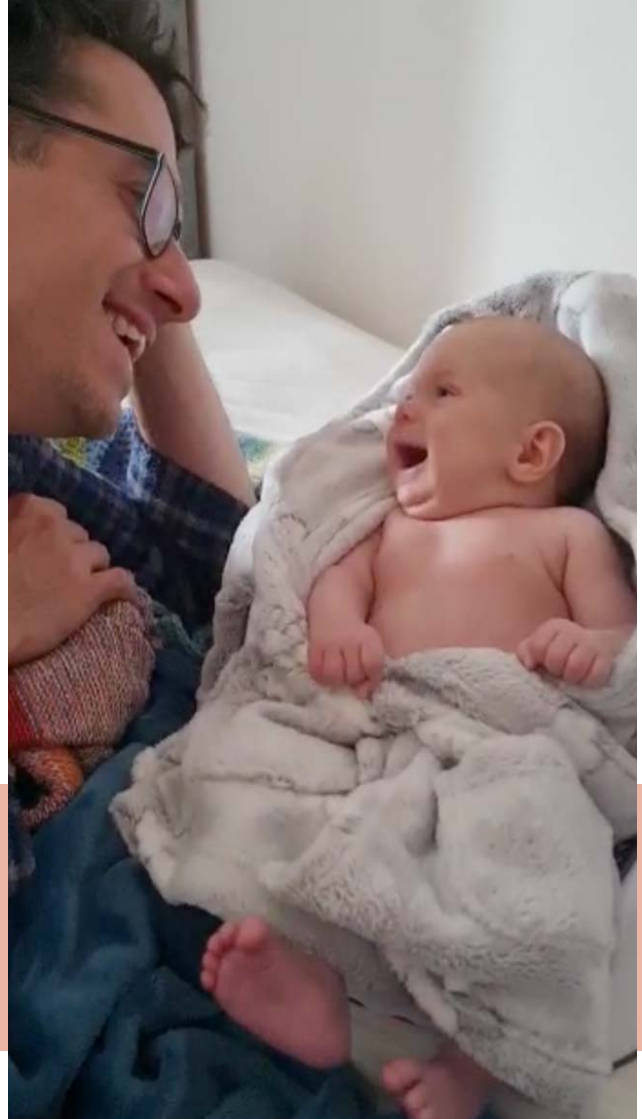
Through repeated exchanges of tactile, facial and vocal emotions, baby comes to resonate with others' feelings.



Connection
Network



Self & Other
Network

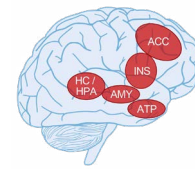


Synchrony

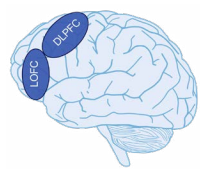


allowing...

Synchrony



Stress-Fear-Pain
Network

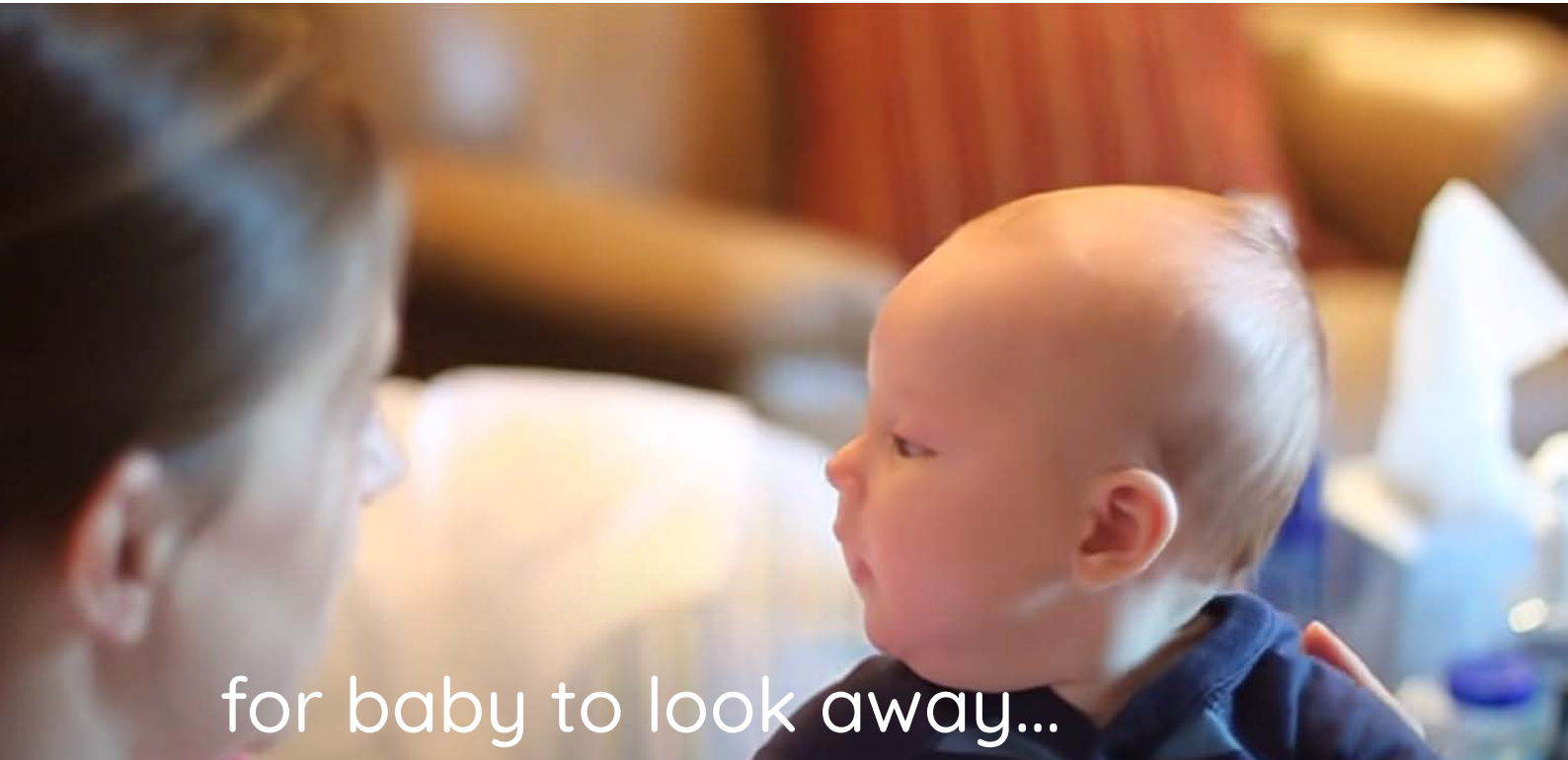


Regulation
Network



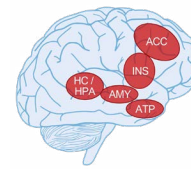
time and space...

Synchrony

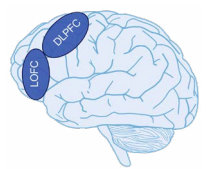


for baby to look away...

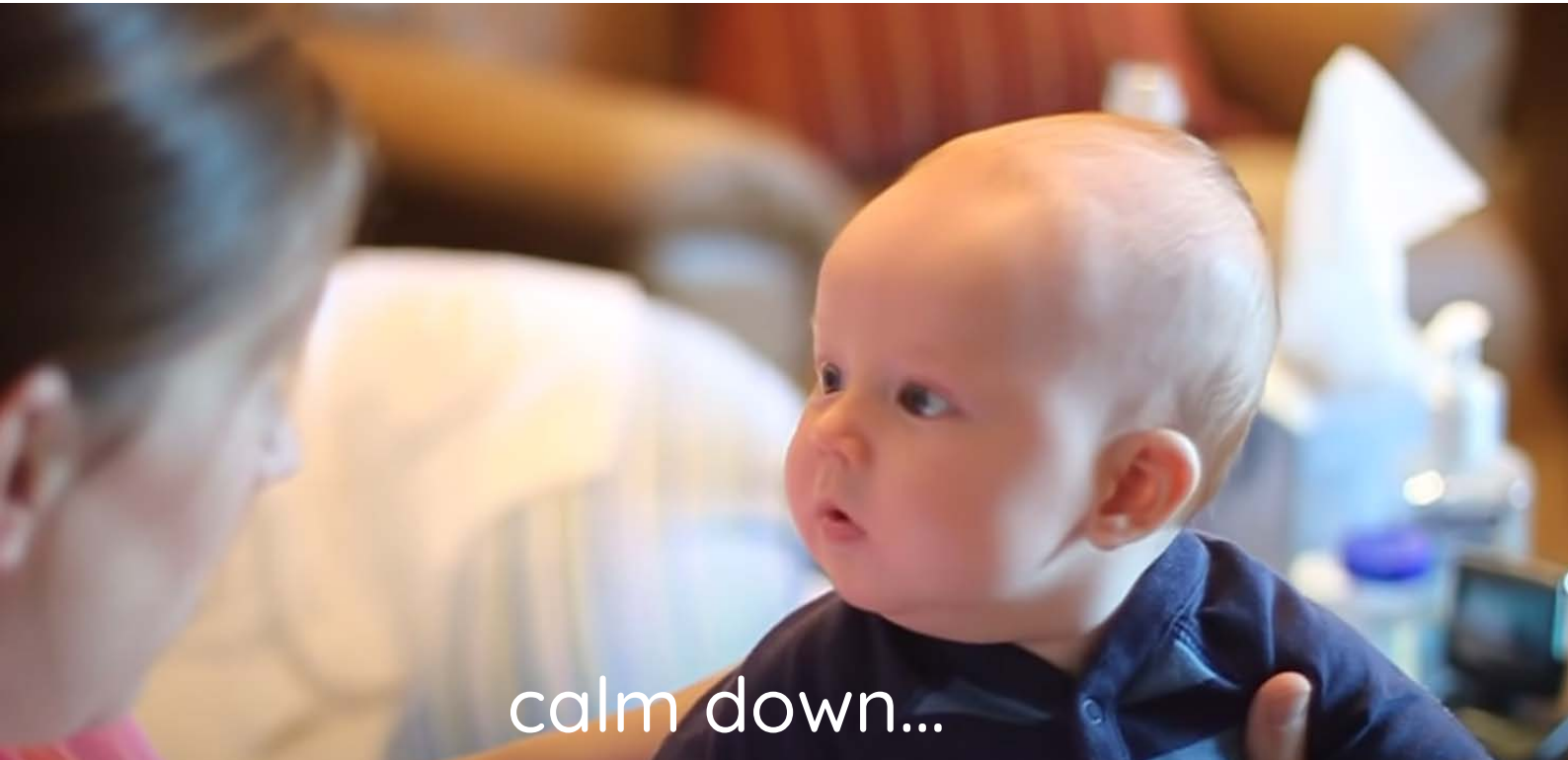
Synchrony



Stress-Fear-Pain
Network



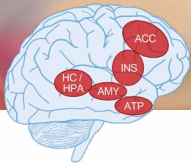
Regulation
Network



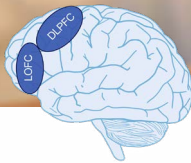
calm down...



...and reconnect.



Stress-Fear-Pain
Network



Regulation
Network

Enables baby to gain control over their arousal levels
and their ability to calm themselves down.

Synchrony

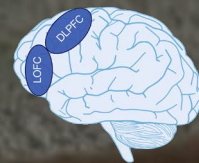
Mirroring...



Regulation
Network

Synchrony

baby's distress...



Regulation
Network

Synchrony

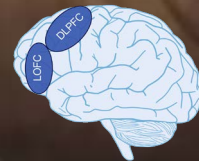
then gently...



Regulation
Network

coming back to smiles...

...together.



Regulation
Network

Synchrony

Shows baby
that they can
express their negative feelings,
have them **recognised**,
and then
choose,
together with their grown up,
to
feel
better.



Together with a team of international collaborators, we work towards better understanding the biological and brain basis of human social relationships. In so doing, we are especially interested in caregiving and attachment.

Most recently, our efforts have led to the formulation of the first functional neuro-anatomical model of human attachment (NAMA).

As we become more confident in our ability to explain how our bodies and brains orchestrate caregiving and attachment behaviours, it is important to translate our findings for the benefits of as many parents as possible.

This Babygro Book does exactly that. It was a great pleasure and honour to contribute to its realisation.

Dr Pascal Vrticka

is a Social Neuroscientist & Lecturer who directs the Social Neuroscience of Human Attachment Lab at the University of Essex. He is also a Babygro Associate Trustee.



SoNeAt Lab
Social Neuroscience of Human Attachment Lab

Further Reading and Viewing

Scientific Articles

Below are 5 key scientific articles from science journals. They can be found online, are open access and free to read:

- Long, M., Verbeke, W., Ein-Dor, T., & Vrtička, P. (2020). A functional neuro-anatomical model of human attachment (NAMA): Insights from first-and second-person social neuroscience. *Cortex*, 126, 281-321. <https://doi.org/10.1016/j.cortex.2020.01.010>
- Lee, A., Poh, J. S., Wen, D. J., Tan, H. M., Chong, Y. S., Tan, K. H., ... Rifkin-Graboi, A & Qiu, A. (2019). Maternal care in infancy and the course of limbic development. *Developmental cognitive neuroscience*, 40, 100714. <https://doi.org/10.1016/j.dcn.2019.100714>
- Müller, M., Zietlow, A. L., Klauser, N., Woll, C., Nonnenmacher, N., Tronick, E., & Reck, C. (2021). From Early Micro-Temporal Interaction Patterns to Child Cortisol Levels: Towards the Role of Interactive Reparation and Infant Attachment in a Longitudinal Study. *Frontiers in Psychology*, 6463. <https://doi.org/10.3389/fpsyg.2021.807157>
- Rifkin-Graboi, A., Kong, L., Sim, L. W., Sanmugam, S., Broekman, B. F. P., Chen, H., ... & Qiu, A. (2015). Maternal sensitivity, infant limbic structure volume and functional connectivity: a preliminary study. *Translational Psychiatry*, 5(10). <https://doi.org/10.1038/tp.2015.133>

- Yaniv, A. U., Salomon, R., Waidergoren, S., Shimon-Raz, O., Djalovski, A., & Feldman, R. (2021). Synchronous caregiving from birth to adulthood tunes humans' social brain. Proceedings of the National Academy of Sciences, 118(14). <https://doi.org/10.1073/pnas.2012900118>

Docuseries

Scientific studies by Ruth Feldman, Ed Tronick and Anne Rifkin-Graboi on Synchrony and Responding to Babies' Cues are featured in **'Babies - Episode 1 - Love'**.

This docuseries can be viewed free-of-charge on the Netflix YouTube Channel:
<https://www.youtube.com/watch?v=YOV5jDFtvsI>



Babygro is steered by trustees who work in adoption, are experts in attachment theory and who are academics in the field of psychology, behaviour and evolution.

Our focus is less on prescribing parenting advice and more on providing a direct line to the latest research findings.

In this way parents can feel empowered about the parenting choices they make.

